

## EXHIBIT A

**GROOVER & ASSOCIATES, P.C.**  
17000 Preston Road, Suite 230, Dallas TX 75248  
1-972-380-6333; fax -380-4445; groover@technopatents.com

Transmission of . . . . . 3 page(s) total

TO: Laura Turley

cc: ☒ Mitch Markow

**RETRANSMISSION**

From: ☒ Robert Groover ☐ Betty Formby ☐ Matt Anderson  
☐ Eric Jorgenson ☐ Allen Lineberry ☐ staff

Confirmation follows: ☐ Yes ☒ No

Re: New idea from Mitch Markow's group

Desktop Speaker System

Dear Laura:

They have built a desktop computer model which has a mono speaker mounted in the back side of the chassis. The chassis is acoustically a very leaky box, so the speaker is optimized as if it were a free-air driver (using large cone area and long throw). In this example, the driver is a dynamic driver with eight millimeters of throw and a cone area of 90x50 millimeters. In this example, the driver is centered in the back of the box so that there is at least an equal left-right split, although not true stereo. The front of the box is normally somewhat acoustically leaky, and this helps to move the acoustic image forward. In future versions, it is contemplated that the front of the box may be made more leaky, e.g., by adding perforations or a grill.

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The treatment of the box as being acoustically leaky that the airflow required for thermal management has not been interfered with. The budget for internal volume is fairly large so that the speaker itself can be a large speaker. In fact, the use of a long throw speaker permits the volume velocity of the speaker to be maximized. The treatment of the box as very leaky also means that no user changes or custom configurations will significantly disturb the expected acoustic environment.

In other boxes, it has been discovered that speakers mounted on the front baffle could potentially cause problems with CDROMs skipping. The previous DeskPro 2000 version, the Presario 2000 series, and some of the commercial workstations, had front-mounted internal speakers.

The power budget for this rear speaker is 5 or 6 watts, but this is not critical. The speaker is preferably mounted on rubber grommets, for mechanical isolation in the chassis. (This helps to avoid skipping in the CDROM drive).

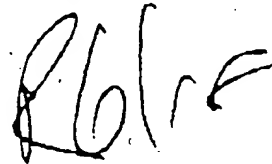
The rear-firing speaker helps to keep the acoustic image moved somewhat to the rear, i.e. out of the user's face, and also helps to improve spatial ambience by increasing the ratio of reflected to direct sound. However, the leakiness of the box provides some acoustic emission toward the front, which is also advantageous background sound.

This is particularly advantageous in an office environment, where the noise from one computer's speakers has some potential to bother the users of other computes. This configuration makes the acoustic output, as heard by other users, more like diffuse ambient noise, and hence more easily ignored.

Following are some draft claims, based on my initial understanding of the invention:

- A. A computer system comprising:
  - a chassis which includes at least one motherboard..., said chassis having a rear wall which faces away from a user in normal use; and
  - a loudspeaker mounted in said rear wall.
- B. A computer system comprising:
  - a chassis which includes at least one motherboard..., said chassis having a rear wall which faces away from a user in normal use; and
  - a loudspeaker mounted in said rear wall;wherein said loudspeaker is optimized as a free-space driver, and not as if said computer chassis were an acoustic suspension box nor a ported speaker box.

If you have any comments, suggestions, or questions, please do not hesitate to call me or fax me. With best regards,



## EXHIBIT B

**GROOVER & BACHAND, P.C.**

17000 Preston Road, Suite 230, Dallas TX 75248  
1-972-380-6333; fax -380-4445; [groover@technopatents.com](mailto:groover@technopatents.com)

FAXED  
JAN 6 1999

Wed. Jan. 6, 1999: Transmission of . . . 22 page(s) total

TO: Mitch Markow 281-518-0979

From: ☐ Robert Groover ☐ Betty Formby ☐ Matt Anderson  
☐ Allen Lineberry ☐ Stephen Loe  
☐ Jerald Gnuschke ☐ staff

----- **NOTICE** -----

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# Computer with Speaker Built Into Acoustically Leaky Chassis

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U.S. Patent Application of:

Mitchell Markow,  
David Gough,

Inventor

Inventor

Compaq Computer Corporation,

Assignee

Attorney's Docket No. P98-2401

Robert Groover, REG. PAT. ATTY.

Jerry Gnuschke, REG. PAT. ATTY.

## EXHIBIT C

FAXED  
2/17/99

**GROOVER & BACHAND, P.C.**

17000 Preston Road, Suite 230, Dallas TX 75248  
1-972-380-6333; fax -380-4445; [www.technopatents.com](http://www.technopatents.com)

Wed. Feb. 17, 1999: Transmission of . . . 7 page(s) total

TO: Mitch Markow, MS 120810, Cmpaq Computer  
Corporation, 281-518-0979

From: Allen Lineberry

Confirmation follows: ☐ Yes ☒ No

Re: Our file P98-2401, Client's Ref: P98-2401: Proposed:  
**"Computer with Speaker Built Into Acoustically  
Leaky Chassis" - Mitchell Markow, David Gough -  
Possible Bar Date due 03/01/99**

Dear Mitch:

The claim numbers in the dependent claims changed a bit but were not updated prior to faxing you the application. The following pages should be substituted for the claim pages that were faxed last night.

If you have any comments, suggestions, or questions, please do not hesitate to call me or fax me. Very truly yours,



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## EXHIBIT D

**GROOVER & BACHAND, P.C.**  
17000 Preston Road, Suite 230, Dallas TX 75248

972-380-6333; FAX 972-380-4445; [www.technopatents.com](http://www.technopatents.com)

Richard A. Bachand, *Reg'd Patent Atty.*  
Robert Groover III, *Reg'd Patent Atty.* †  
Dr. Betty Formby, *Reg'd Patent Agent\*\**  
Jerald J. Gnuschke, *Reg'd Patent Atty.* †  
Stephen R. Loe, *Patent Atty. (provisional)* †  
Allen S. Lineberry †

Albuquerque office:  
Richard A. Bachand, *Reg'd Patent Atty.*  
Earl H. Baugher Jr., *Reg'd Patent Atty.* \*  
\* (Not Admitted in Texas)  
† (Not Admitted in New Mexico)  
\*\* (Not Admitted to any State Bar)

February 26, 1999

Diane Strong  
Compaq Computer Corporation  
20555 State Highway 249  
Mail Stop 110701  
Houston TX 77070

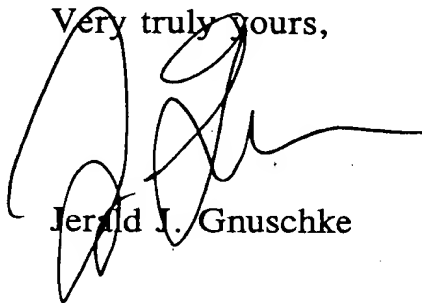
Re: Our file P98-2401, Client's Ref: P98-2401: Proposed: **"Computer with Acoustic Driver Built Into Acoustically Leaky Chassis"** - *Mitchell Markow, David Gough*

Dear Diane:

Enclosed is the final draft, with formal papers, for the inventor(s) to review and (hopefully) sign.

As always, please do not hesitate to call me or fax me if you have any comments, suggestions, or questions.

Very truly yours,



Jerald J. Gnuschke